TWO DIMENSIONAL INSTRUMENTS, LLC

A Revolution in Chart Recorders
Advantages of the ThermaViewer™

Revolution

The **ThermaViewer™** (A Paperless Chart Recorder) combines the best features of the chart recorder and the data logger and is becoming established as the preferred option in the majority of new and retrofit temperature recording applications.

An LCD-display replaces the old paper chart and offers the local display of the traditional paper chart recorder, while the RAM memory offers the electronic storage capabilities of a data logger. All in all, this precision instrument offers greater flexibility, lower cost and longer life then the old chart recorder.

It puts simple-to-understand trend indications right on the LCD in a graphic format that can easily be seen and interpreted by even the most unskilled of workers. And if it is installed in a heavily trafficked area every employee becomes part of the quality control process as they glance at it while walking by.

A computer interface allows the data to be downloaded periodically or automatically and saved as an encrypted data file for archiving and/or printing out.

No Pens, No Paper, No Mess!

Rather than expensive paper charts that must be replaced frequently and can tear, smudge and jam, the ThermaViewer uses a high quality LCD display, and all-electronic circuitry.

The LCD display not only shows the charts of a traditional paper recorder, but its flexibility also provides, a variety of trend information, alarm triggers, and an intuitive user interface for setup and operation.

Lower Cost.

Recent innovations in the **ThermaViewer™** have already brought the cost down to where it is comparable to chart recorders, especially where multiple probes are used to monitor multiple sites. One ThermaViewer can do the work of two chart recorders in most cases. This trend

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will continue, as volumes increase in the same way that PCs are now a fraction of the cost they were when introduced to the market. Since the ThermaViewer has no moving parts it will not jam or wear out so there is no repair or replacement costs.

The user saves in three ways. The initial purchase price is less than the mechanical chart recorder, there are no consumable supplies like paper and pens to purchase and it has no mechanical parts to wear out making it basically maintenance free.

Stores a lot of data

The **ThermaViewer**™ stores over 44,000 data points for each of its two probes. If it is set to sample and store temperature every 10 minutes it will store over 10 months of temperature history. If it is taking a reading every hour it will store over five years of data. Once the memory is full new readings write over the oldest data. If the ThermaViewer is collecting temperature and relative humidity it store 44,000 points for each of its four channels, (2 temp & 2 RH).

Flexible data display

Because the logged data is displayed on the LCD, the chart can be electronically manipulated to highlight information that is important to the user. For example, in addition to scrolling back and forth along the data, it has a zoom feature that can redraw the chart to display weeks or even months of data on the screen at one time. And a trace mode can be used to highlight specific temperatures showing not only the exact temperature but also the hour, minute and second that the reading was taken right from the display itself.

Wider temperature range

Any temperatures that can be collected can be displayed on the **ThermaViewer**™ LCD-display. The only limiting factor is the type of probe used. If a K-type thermocouple is used, you could monitor –180°F liquid nitrogen for a week and then move the same instrument over to monitor a 1500°F oven the next day. And because of the flexibility of the display it can be changed to highlight only the temperatures you are interested in. For the liquid nitrogen you might set the display parameters to show all the temperatures between –200°F and –120°F. For the 1500°F oven the range can be reset to show temperatures between 1300°F and 1650°F. The parameters can even be changed without losing the previously collected data.

Longer probe cables

Another very big feature of these instruments is the ability to position the sensors hundreds of feet away from the device itself. This is possible because the cables carry only digital signals

that are not as subject to noise interference or signal degradation over distance. Even if an analog sensor, such as a thermocouple of a thermistor, is used, the data is converted to a digital signal before it is send to the display unit.

Data Downloading

The **ThermaViewer**™ download software is open source and can be used to 'pull' collected data from the ThermaViewer on demand or set to automatically extract data on a regular basis. For instance, if set to auto-dump every five minutes it will collect the last five minutes of data and append it to a file saved on the hard drive of the users computer. The file name will be prefaced with the month and year. Once a new month occurs a new file is started and data is written to that file, etc… The files themselves can be encrypted so that those uses who must comply with 22CFR11 are protected.

Alarm Relay

The **ThermaViewer**™ has a N.O. relay which is triggered if the collected temperature is outside the range of user set parameters. The alarm parameters allow for dwell time in addition to a temperature trigger point. For example, if a ThermaViewer is monitoring a 40°F refrigerator the alarm can be triggered if the temp is over 44°F for more than 30 minutes or below 35°F for more than 20 minutes. The relay is simple a relay so it can be used to actuate another relay, set off a local alarm, trigger an auto dialer or any other purpose the user needs.

Summary of Benefits

The **ThermaViewer**™ has the following advantages:

1. Its remote probes that can be positioned far away from the display.
2. It is Easy to setup and it begins collecting data immediately.
3. No programming or maintenance.
4. The simple chart display can be read by a 12 year old.
5. Multiple data displays: Zoom in/out; Scroll back & forth; trace mode.
6. It automatically turns the display off to save power if power is interrupted.
7. Continues to collect data during a power outage.
8. Trigger alerts or a dialer in emergencies.
9. Requires no maintenance or supplies (paper, pens, PC, chart changing).

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Comparison Chart

	ThermaViewer	Data Logger	Chart Recorder
Data Channels	**4**	**1**	**2**
Initial Cost	**Low Cost**	**Low Cost**	**High Cost**
Ongoing Expense	**No**	**No**	**Yes**
Data Points Stored	**160,000**	**32,500**	**none**
Sample Rate	**15 sec-60 min**	**10 sec–24 hrs**	**Continuous**
Stores Data	**Yes**	**Yes**	**No**
Displays Data	**Yes**	**No**	**Yes**
Display Type	**LCD (graphic)**	**None**	**Paper Chart**
Remote Probes	**2**	**1**	**1**
Probe Cable Length	**1 inch >100 feet**	**10 inches**	**10 ft**
Probe signal	**Digital/Analog**	**Analog**	**Analog**
Battery Backup	**Standard**	**Battery Run**	**Optional**
Alert Relay	**Standard**	**Extra**	**Extra**
Temperature Ranges	**-250° to 2500°F**	**-238° 2000°F**	**0° - 185°**
Stand-alone	**Yes**	**No**	**Yes**
Maintenance	**No**	**Yes**	**Yes**
Technology	**Electronic**	**Electronic**	**Mechanical**
Multiple Displays	**Yes**	**No**	**No**

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